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ARCHÆOLOGY AND ETHNOLOGY.

Prehistoric Occupation in Cambodia.—Shell-heaps in Asia.—Polished Stone Implements in the National Museum.—The principal river of Cambodia is the Me-Kong. Its source is far up in the mountains of Thibet, where it has the name of Lam-Thsang-Kiang. It traverses the Chinese province of Yum-Nan, and those of Laos and Cambodia, and enters the China Sea in the French province of the latter name, in latitude 10 degrees north, longitude 106 degrees and 40 minutes east. Its average width through Cambodia is 3,500 to 4,000 feet. In its lower portion it divides itself many times and forms a network of navigable waters, and finally discharges itself through eight mouths.

The present capital of the province is Phnom-Penh, situated on the Me-Kong, about one hundred and seventy-five miles from its mouth. At the city of Phnom-Penh the river Me-Kong forks. It is the western fork with which this account deals. The eastern branch is the main river; the western branch is but a blind stream which, after the fashion of a bayou, is fed from the main river. Its length is one hundred and seventy-five miles, and it ends in an immense lake eighty or ninety miles in length called Ton-le-Sap.

Each year the Me-Kong river, by reason of the melting of the snows in the mountains of the central plateaux of Thibet, overflows and inundates the lower country which it traverses. The level of the lake Ton-le-Sap is about thirty-six feet lower than that of the Me-Kong river at Phnom-Penh where the bayou joins the river. The period of inundation is the months of July, August and September, and at their beginning the waters from the river fill the bayou, run northward through its length, and empty in and fill the lake. During the inundation the water in the lake attains a depth of thirty-five or forty feet, and, consequently, spreads over a vast extent of the country which before was uncovered. On the termination of the flood and the subsidence of the water in the river, the current in the bayou is reversed; it runs south, empties into the river, and so drains the lake. During the dry period, which lasts six months of the year, Ton-le-Sap, instead of being a great lake of water, is a plain of soft mud.

The action of the water in this river and lake is similar to that of the Nile and the lake Moeris in Egypt. It is easy, with the illustration of the Nile, to understand the operation, and also the quantity of alluvial soil which would be deposited each year in the lake Ton-le-Sap, likewise the numerous changes made in the shores of the lake during the ages this operation has been going on.

On the retreat of the waters, the shores of the lake and little islands in it become dry. The people from the neighboring highlands come down, occupy these spots, and there appear flourishing villages, which are to last, however, only six months of the year, when they will be submerged by the next year's inundation, the inhabitants being driven to the highlands for safety.

The geographic and hydrographic details being understood, we may now explain the prehistoric stations of the neighborhood. Not far distant from the border of this great lake there have been found numerous and vast Kjoekenmoeddings, or shell-heaps, many of which have been excavated by the natives to obtain the material for fabrication of lime. It was from these shell-heaps that Mr. Jammes obtained the stone implements which have lately come into the possession of the National Museum. He discovered eighteen of these shell-heap stations, and excavated some of them. They are covered by a stratum of alluvial soil, the deposit of the floods. The depths or thicknesses of the shell-heaps were from thirteen to twenty-nine feet. They were composed of three layers quite distinct from each other, and each bearing evidence of a different civilization and an occupation by a different set of men. They were as follows, commencing at the top:

The first stratum had the least thickness. In it were instruments of copper, though possibly some of bronze—hatchets, pins, bracelets, etc. There were pieces of stone finely worked. The pottery was of the most perfect form, and some of it was ornamented with the ordinary designs of the bronze age.

In the second stratum were objects in stone mixed with those of the bronze or copper, and this is considered to mark an epoch of transition between the bronze age and the stone age which formed the lower stratum.

This lower stratum was the deepest of the three, and here were found the implements and pottery which belonged to the age of polished stone.

These shell-heaps have required a long period of time. Some of them were distant more than fifty miles from the great lake, and it is supposed that at their epoch they were on the borders of the lake thus extended. In the lake of Ton-le-Sap are now found several species of the same shells and mollusks as those of the prehistoric stations, but the latter are thicker and heavier. It is certain from this and other discoveries that the period of the polished stone age is very ancient in Indo-China, possibly of higher antiquity than the same age in Europe, though there has, as yet, been no synchronism established between them. It is now more than 2,000 years since the Khmers, of whom the Cambodians pretend to be the descendants, constructed temples and palaces which were of sufficient dignity to have belonged to the antiquity of Egypt. These are all in ruins, yet the voyager can still see enough to show them in their gigantic and barbaric splendor. The temple of Ang-Kor-What, of which Mr. Jammes has made an attempt at restoration, is not less than 3,900 feet in the length of its principal façade, by one hundred and sixty or one hundred and seventy feet in height. It was built of cut stone and is ornamented everywhere with superb sculptures and bas-reliefs. To-day these imposing ruins are invaded by a tropical vegetation that has covered and suffocated them in its embrace. On the ruined and fallen towers, or in the earth about them, enormous trees now grow, and sometimes portions of the wall, windows or doors are sustained and supported by the roots of the great banian trees.

Anthropology demonstrates that the men of the epoch of polished stone were the ancestors of the constructors of the great temples in the Orient, though they were then in full possession of iron, silver and gold. How many centuries of this rude civilization was required to traverse the space between the polished stone age when these shell-heaps were made, and in which its objects and implements were lost or deposited, until the brilliant period of the temple of Ang-Kor-What?

The anthropological side of this subject has not yet been studied. We are in ignorance of the facts, and are without sufficient knowledge to be able to even approximate this great progression. Mr. Jammes found several skeletons in his excavations of these shell-heaps. He calls the people the race of Som-rong-sen, after the name of the principal shell-heap. The people of the race he remarked as being of large proportion, great height, and vigor. Some of the skeletons were, as he reports, more than two metres in height. What seemed to astonish him more than anything else was the thickness of the skull, which sometimes attained twelve millemetres in the occipital region.

The men of these shell-heaps buried their dead in their habitations. The care that they took in the position of the skeletons is a slight evidence of their belief in a future life. Near the bodies were frequently placed various implements of their industry. Pieces of pottery were found filled with the débris of food.

This civilization belongs to a prehistoric race, and corresponds with a mixture of the polished stone and bronze ages in western Europe.

The objects found were some of them similar; others only analogous. The polished stone hatchets, and similar implements, were the most numerous. They were not nearly so well made nor so complete as those from other countries. The material is usually a fine, hard, compact and siliceous schist, sometimes yellow or gray, other times black, frequently made of a pebble with remains of its original crust apparent. Some of them would indicate a new method of handling, for they have a straight stem or tang, as large square as the thickness of the hatchet, and which is cut down at the edges so as to make shoulders. The tool most plenteous is the adze. Its sharpening is all done from one side. Gouges are found, though not so common. They are made in the same way as were the adzes, except that the edge is polished. Objects of shell are frequent; bracelets, rings, and beads are made of this material. It also served for scrapers and cutting implements. Objects of bronze were not found, but those of copper were.

Mr. Jammes is Director of the Royal School of Cambodia at Phnom-Penh, and he displayed his collection at the International Congress of Anthropology and Prehistoric Archæology held at Paris last summer.

PROCEEDINGS OF SCIENTIFIC SOCIETIES.

The American Geological Society.—At its late meeting in New York, December 26-28, the following papers were presented (Continued from the NATURALIST, February, 1890, page 212.):

ON THE TERTIARY DEPOSITS OF THE CAPE FEAR RIVER REGION. William B. Clark, Baltimore, Md.—The Eocene occupies small detached basins within the Cretaceous, while the Miocene extends widely over Eocene and Cretaceous alike.

Post-Cretaceous erosion left an irregular surface over which the older Tertiary deposits were scattered. Post-Eocene erosion approximately base-leveled this surface, leaving the early Tertiary sediments preserved in the deeper Post-Cretaceous depressions. Upon this base-leveled surface the Miocene strata were laid down.

An intermingling of numerous characteristic Cretaceous species with Eocene forms was observed at several places; likewise of *Exogyra costata* hiwt Miocene types.

CRETACEOUS PLANTS FROM MARTHA'S VINEYARD. C. D. White, Washington, D. C.—The topics treated in this paper are: Review of